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RAIL-ROAD NEWS.

Railroads of the United States.

By a circular from the Census Office at Washington, we learn that there are 10,814 miles of railroads constructed in the United States and 10,898 in the course of construction, The cost of the railroad in operation amounts to $348,000,000. The longest of these is the New York and Erie Railroad, which is 469 miles, with two branches sixty-eight miles in length. The cost was $23,580,000; $43,333 per mile. The State advanced $6,000,000 towards the work and afterwards released the company from the loan; that is, the State made a present to the stockholders of more than one-fourth of their stock.

In the year 1850 Congress passed an act, after a very protracted discussion, granting to the State of Illinois about 2,700,000 acres of public lands to aid in the construction of the Central Railroad. This magnificent donation is reckoned by the company to which Illinois has confided the building of the road, to be worth $18,000,000. This was the first instance in which the aid of the national government had been extended to a railroad project.

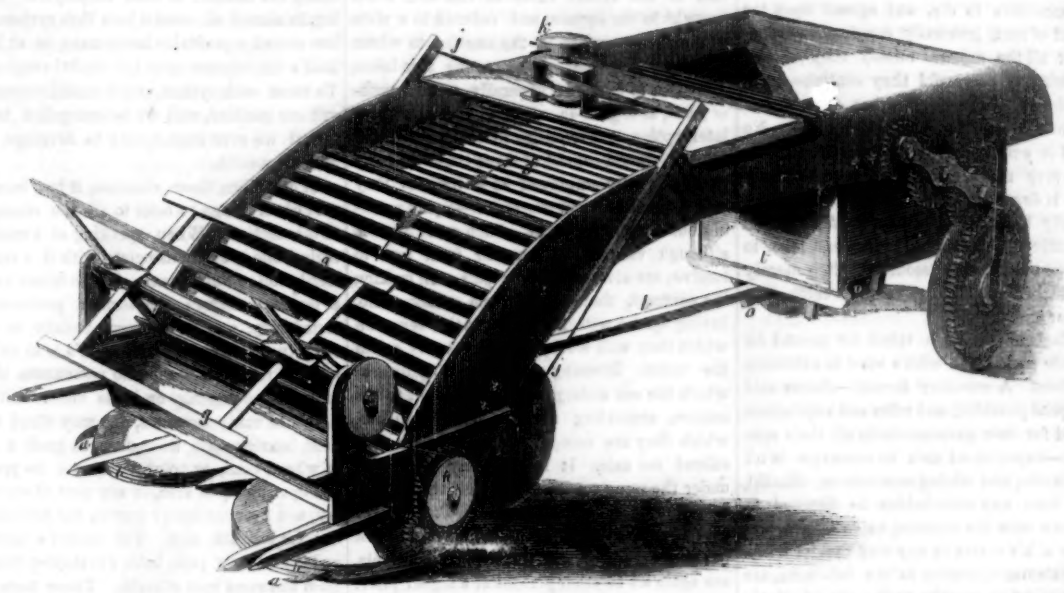
But since the above grant, innumerable applications have been made from all the new States for cessions of land for railroad purposes. Whether such further aid shall be extended is now a much agitated question in American politics. Bills are pending in Congress proposing to cede for these purposes about 20,000,000.

The rate of speed on our railroads is not so great as on those of England. The ordinary velocity of a passenger train is twenty miles an hour, but on some routes it is as high as twenty-eight and thirty miles. Express trains, on such occasions as the conveyance of the President's Message, frequently maintain for long distances as high a speed as forty-five miles an hour. And on one road, that between New York and Albany, forty miles per hour is the regular rate for all passenger trains.

The fares or rate of passage are not uniform. In New England, the average price per mile for the conveyance of passengers is under two cents; from New York to Boston it is two and four-tenths; from New York to Philadelphia, three and four-tenths; from Philadelphia to Baltimore, three and one-tenth. From New York to Cincinnati, the distance is 857 miles by the northern route, of which 143 miles are travelled by steamboat. The price of passage for the whole distance is $16 50, being slightly under two cents per mile. The lines between Baltimore and Cincinnati, soon to be opened, will be 650 miles in length, and the fare will be $13; that is, two cents per mile.

It is very difficult to form an estimate of the average expense per mile of building railroads in the United States. In fact, no average can be assumed as applicable to the whole country. The cost of the roads in New England is about $45,000 per mile; New York $40,000 and in some of the Western States, only $20,000.

JONES' PATENT HARVESTING MACHINE.---Fig. 1.

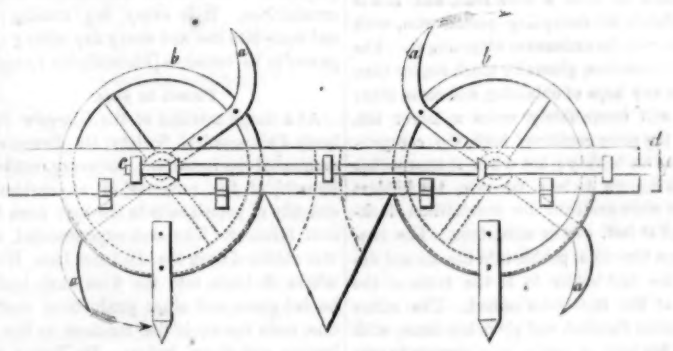


The accompanying engravings (figure 1 a perspective view, and figure 2 a plan view of the cutters) represent the Harvester of Mr. Wm. Jones, of Bradford, Orange Co., Vt., for which a patent was granted on the 8th of last July (1851.) The same letters refer to like parts.

The nature of the improvement consists, firstly, in the use of rotating cutters on vertical shafts, in connection with the reel which serves to bend over the grain previous to its being cut; also in the use of two endless aprons instead of one. Secondly, in the use of two steering wheels, instead of one, and an adjustable lever, for the purpose of raising and lowering the front part of the machine. Thirdly, in the novel manner of constructing the bundling apparatus so that the bundle shall be entirely separated from the grain running into the hopper previous to its being laid on the ground.

The cutters, *a a a a*, are attached to the fly-wheels, *b b*, and rotate in the direction shown by the arrows; these fly-wheels are secured to short vertical shafts, and receive their motion either by bands or gears from the horizontal shafts, *c c*, by the bevel gears, *d* and *h*.

Figure 2.



wards the back end of the machine. The bundling fly keeps the grain from falling into the bundling chamber, *t*, and may be operated by the hand or by the horse power.

The leaves, *o o*, of the bundling table are constructed on levers with circular ends, on which rests a treddle bar, and the table is operated by these, either with the foot or by power from the wheels.

OPERATION—As the machine advances, the motion is transmitted to the small wheel, *r*, to which is attached the shaft or drum over which the longer apron runs, the power or motion is thereby transmitted at the front part of the machine, and by the use of bands or gears, the motion may be communicated to the reel and cutters.

The reel bends down the grain and brings it under the action of the apron; the grain is then carried between the aprons nearly to the top of the curve, thence on the top of the longer apron to the place of bundling, and is deposited in the hopper, then by one revolution of the bundling fly, a sufficient quantity of grain for a bundle is dropped into the bundling chamber, and at the same time the foot of the operator being pressed down upon the treddle, the leaves, *o o*, of the bundling table are closed, and the grain is thereby secured in the bundling chamber, and when the foot is removed, the leaves open and the grain falls at once upon the ground and is ready to be bound into bundles. [The treddle levers are not shown.]

The frame work to which the cutters are appended, is to be secured to the machine under the reel, *g g*. *f f*, on fig. 1, show the position of broad endless bands, which move in the direction as shown by the arrows; the longer one serves as a band for communicating the power or motion to the front part of the machine, for the purpose of cutting the grain. An adjustable lever (not shown) serves to elevate and depress the front part of the machine for the purpose of cutting the grain at any desirable height. The front, or steering wheels, are turned so as to vary the course of the machine by means of a lever, which is fastened to the axletree at one end and at the other end are attached the cords, *j j*, which run up on each side of the machine, and are wound in opposite directions around the roller, *k*, at the top of the machine; this roller can be extended to the hinder part of the machine and be operated by the person standing there. The bar, *l*, passes between the horses, and serves to press forward the front part of the machine, thereby lessening the strain on the sides. The bundling fly, *n*, and the hopper, S, are constructed of sufficient length to admit of the grain being laid straight, with the heads to-

Mr. Jones has taken measures to secure the improvements of the general arrangements here described, in addition to his previous patent. More information may be obtained by letter addressed to him as above directed.

Ozone---What is it?

The discoverer of ozone is Schonbein, the inventor of Gun Cotton. Ozone is produced when the electrical brush passes from a moist wooden point into the atmosphere, or when phosphorus acts at common temperatures on a moist portion of the atmosphere. To produce ozone, take a clean piece of phosphorus, about half an inch long, which has been recently scraped; put it into a clean quart bottle, at a temperature of about 60° Fahr., with as much water as will half cover the phosphorus; close the mouth slightly, so that if inflammation takes place, no harm may happen, and leave it. The formation of ozone will quickly occur, being indicated by the luminous condition of the phosphorus, and the ascent of a fountain-like column of smoke from it. In less than a minute the test will show ozone in the air of the bottle; in five or six hours it will be comparatively abundant.

Ozone is a gaseous body of a very peculiar smell; when concentrated, it has an odor like chlorine; when diluted, it possesses what is called "the electric smell." Atmospheric air charged strongly with it, renders breathing difficult, causes unpleasant sensations, and produces catarrhal effects. It is insoluble in water. It discharges vegetable colors like chlorine. It does not unite with nitrogen under ordinary circumstances, but it does when lime water is present. It acts powerfully on metallic bodies; it peroxidizes lead and silver very quickly. It is one of the most powerful oxidizers that has ever been discovered. It acts upon almost all salts, and is very nearly related in its effects to chlorine.

The Bangor Whig says that the ice in the Penobscot appears somewhat as it did six years ago, prior to the great spring freshet. The anchor ice has formed; and along the river is twenty-five feet deep, not solid, but compacted like a snow-ball. The channel of the river is not choked up as it was six years ago, but still the fact of there being so much anchor ice leads to some fears as to the effect of a spring freshet.

MISCELLANEOUS.

Geology of the Lead Mines—No. 4.

It is hardly necessary for us to advert to the manner in which mining is prosecuted in this section; yet we will do so for the information of those who "are not to the manor born." With us, it is almost universally the united effort of from two to four individuals; their capital, a set of mining tools, worth some five dollars, and stout hearts and willing hands to labor After having made a verbal agreement with the owner of mineral lands, for permission to dig, and agreed upon the amount of rent, (generally one-fourth or one-fifth of all the mineral raised) they proceed to work. If successful they continue their operations; if not, they either sink a new shaft, or abandon the ground altogether. No capital is employed; so far from it, that in many, very many, cases with us, the hardy miner is dependent upon his daily success for his daily bread. No companies formed—no systematic united effort of capital and labor to develope our mineral resources. It is merely individual efforts to acquire the wealth that lies near the surface.

In England a lease is taken for ground for a definite period, and with a view to extensive operations. A company formed—shares sold—a capital provided, and rules and regulations adopted for their government in all their operations—experienced men to supervise in all departments, and mining commences. Should, at any time, any shareholder be disposed to withdraw from the concern, he can do so, and dispose of his shares in any way that he wishes. Statements, similar to the following, are made every two months to the stockholders:

"At the ordinary two monthly meeting of shareholders in Bomin Wheal Mary Consols, on Wednesday, the accounts showed:—Balance from last account, £89 13s. 10d.; call of £2 per share on 824 shares, £1,648; ores sold (less dues), £133 15s. 10d.—£1,871 9s. 8d. Cash due to purser from last account, £103 15s. 9d.; March and April cost, including £300 paid on account of engine, £1,035 15s. 10d.; leaving balance in favor of adventurers, £672 18s. 1d. A call of £1 per share was made to pay the balance (£697) owing on account of the 50-inch cylinder engine. A report from Capt. Kernick was read, which stated that an important discovery had been made on No. 1 lode. An ancient level, supposed to have been driven 100 years ago, has been cut into, and upon examination it is found that the old miners had driven on the side of the lode, and the water having crushed and broken down, the level in many places is full of valuable ore; there is a vast quantity altogether in sight."

Upon a comparison of the two systems, should we be surprised at a decline of production in our mines? Or can any estimate be made of the increase of lead, if we were thus operating? The only matter of surprise is, that we have continued to produce the quantities we have, under all our disadvantage; and had not our lodes been rich, and our whole section abounding, as it is, in mineral wealth, we would have abandoned mining long since.

The method of mining in Cornwall, is thus:—With the exception of a small number of individuals, employed as superintendents, clerks, &c., who are paid stated salaries, the labor is performed by contract, made at regular short intervals—generally every eight weeks. These contracts are made publicly, and very similar to auction; work being the article bid for—men the purchasers or "takers," and the price is regulated by their own bids. There is, however, this peculiarity, that the work is always started by the "Captain," at a price much higher than it is really worth, and this price is gradually reduced to a fair one by competition among the men. This system has been pursued in Cornwall for ages, and so well is it adapted to the interests of both employers and employed, that strikes, so prevalent in mining and other branches of industry, are unknown. Work in these mines is principally of three kinds, tutwork, tribute, and dressing. The first is excavations, which have for their ultimate object, the discovery of ore, and are not made, as with us, for the sole object of obtaining it. Shafts, levels, cross cuts, &c., are of this kind, and are paid for by the lineal or cubic fathom, as the case may be. When substances extracted become of any value, the miner then receives, in addition to his bid, a certain proportion of the value of the mineral so taken out by him. It is thus made his interest to save everything that will pay. The price of this kind of work varies from 10 to 200 dollars per fathom. Tribute includes all excavations from which ore is obtained, and which are made solely for the purpose of procuring it. As the quantity and quality of ore is extremely variable, this kind of labor is paid for by a certain proportion of the actual value of the ore, when brought to the surface and reduced to a state fit for the operation of the smelter to whom it is generally sold. In executing this labor, from two to four men generally work together; but, as it goes on night and day, without interruption, it is requisite that the party that takes it, should consist of three times as many as are actually employed at a time, as they relieve each other in succession—a part working but 8 hours in the 24. Such a set of men, although varying in number from two to twelve, are always called a pair. In making the contract, there is only one person, who, having agreed with his pair as to the terms on which they will work, closes it; he is called the taker. Dressing consists of processes which the ore undergoes when brought to the surface, separating it from all impurities, which they are compelled to do, before it is offered for sale. It is generally performed under the same contract with the tribute, but sometimes, by other persons. The poorer part of ores, called halvans, which would not pay for dressing under the original contracts, are again let to other persons at a higher price.

A few days previous to the survey, as the auction is termed, the captains or superintendents of the mine, examine every part of it and determine what works shall be carried on for the next two months. All of this work is accurately specified, and registered in a book kept expressly for this object, and opposite each kind of labor, is marked the rate which, in their opinion, is a fair remuneration for performing it. The captains are selected from the most intelligent working miners, and are well qualified to form correct opinions; as the labor upon which they set a value, is of a kind which they are practically acquainted with. The survey is always held in the open air before the office, where the business of the miner is transacted. In front of the building there is a porch, corresponding in height to the first story. About noon the captains of the mine take their station on this platform, and commence the business of the day. By this time, the miners employed in the mine, as well as others who may be desirous of obtaining employment, are assembled. One of the captains commences by reading aloud a printed form of rules, and prescribes the conditions on which work is to be taken, fines for neglect and idleness, and all other regulations of the mine. The name and descriptions of the first piece of work is then read, and this is immediately bid for by any person who, with his pair, may be desirous of obtaining it. The price is, however, generally much higher than there is any hope of obtaining, and some other party will immediately make a lower bid. While the price continues high, the competition goes on briskly; but when it approaches what is known to be a fair rate, the bidders become more cautious, the competition slackens, and at last, ceases altogether. The captain then throws a pebble into the air and declares the last bidder to be the taker of the work at the last price named. The miner then comes forward, and gives his name, with that of his pair, or party, who engage to perform the work, and their names and terms are publicly registered in the Letting Book, upon the spot. In this manner business proceeds, until all the different pieces of work, or bargains, have been taken by the men. Thus, in a couple of hours, work is disposed of which amounts to several thousand pounds sterling, and insures certain employment to hundreds of persons for the next two months. All waste of time and dispute are thus avoided; and what is of far more consequence to both the workingmen and proprietors, the price of labor is, by this system, continually adjusting itself to a fair standard, and which no combination, of either shareholders or miners, can change. It requires but little examination to premise that by the plan we have been describing, the interests of both men and employers are effectually combined. Tutwork differs but little if any from piece work, so generally adopted as a system in large manufactories. And by the tribute, the wages of the men and the profits of their employers are so regulated, as necessarily to keep pace with each other; for it is evidently the direct interest of the miner to send to the surface and render saleable, as large a quantity of ore as possible, at the least cost, for production; and this is precisely the interest of their employers. Mining, in almost all cases where thus systemized has proved a profitable investment, or at least paid a fair interest upon the capital employed. To some such system, with modifications to suit our position, will we be compelled to resort, if we ever expect fully to develope our mineral wealth.

In compiling these sketches, it has been no part of our design to refer to all the resources of this section. When speaking of a mineral region, one is apt to associate with it, a rocky, sterile soil. Not so ours. These mines are in a fertile country; the surface produces as abundantly, and in as great variety, as any other in the same latitude. Our's is as rich in mineral resources. It is no uncommon thing for us to see diggings on lands under cultivation. In many locations, one may stand in a field, bearing upon its surface as good a crop of wheat, corn, or potatoes, as can be produced upon an equal area, in any part of our valley, and hear the miner tearing the rock asunder far beneath him. The farmer's plough, and the miner's pick, both developing wealth from the same spot of earth. These facts, although they may seem strange, are no less true. We have good agricultural and mineral land combined, and farming and mining are often carried on with us by one person on the same piece of land. E. H. B.

Galena, Ill.

[This concludes the series of articles on the lead ores of the West. They will be of great use for reference to many of our readers, and when bound up with the volume, will take their place as standard articles of a scientific character.

Telegraphing.

Telegraphing, with us, has reached that point, by its great stretch of wires and great facilities for transmission of communications to almost rival the mail in the quantity of matter sent over it. It has become indispensable to many business transactions, and an interruption of the communication between cities is severely felt by the business community. Nearly seven hundred messages, exclusive of those for the press, were sent on Thursday last, over the Morse Albany Line. The Bain Line at Boston, on Friday, sent and received five hundred communications, exclusive of reports for the press. These facts show how important an agent the magnetic telegraph has become in the transmission of communications. It is every day coming more and more into use, and every day adding to its power to be useful.—[Philadelphia Ledger.

Potash in Soot.

At a recent meeting of the Glasgow (Scotland) Philosophical Society, Dr. Penny communicated the important discovery, made by himself, of the presence of a considerable quantity of potash salts in the soot from blast iron furnaces. The soot experimented upon was obtained from the Coltness Iron Works, where it leads into the flues that lead the heated gases and other products of combustion, from the top of the furnaces to the air-heaters and steam boilers. Dr. Penny gave the particulars of a careful analysis of the soot, and exhibited specimens of the potash salt, which had been extracted in large quantities by Dr. Quilan, of Hurlet. The salt has been pronounced by competent judges to be a good marketable article, consisting chiefly of carbonate and sulphate of potash, with a small admixture of soda salts. According to the results of experiments described by Dr. Penny, it appears that soot will yield 50 per cent. of this marketable salt, containing 43 per cent. of pure potash. It has been found that the amount of potash in soot procured from other iron works is subject to variation, arising, no doubt, from the use of different coals in the blast-furnace. From the well-known value of potash salts, there is every reason to expect that this discovery will prove of considerable importance to those who are interested in these commercial products, and also to iron-masters, who will now be enabled to turn to account a substance which has not hitherto been applied to any practical use.

Here, in this discovery, we have the cause explained of the well-known value of soot for agricultural purposes.

The New Jersey Zinc.

In many parts of the world there are large strata of zinc ore; that is, zinc in the form of an oxide mixed with other metallic ores. The ore of the sulphuret of zinc is quite abundant in various parts of the world, and this is generally combined with arsenic, cadmium, iron, and some other mixtures. The sulphuret of zinc is very fractious, and expensive to manufacture, especially to bring it to the white oxide for the purpose of paint. In Sussex Co., N. J., and one or two other counties, we believe, large veins of zinc ore have been known to exist for a great length of time. These zinc ores are mixed with franklinite (an ore of iron) and manganese. It is not a sulphuret, nor is it mixed with arsenic or other volatile metals. For many years, we know, the economical reduction of this ore was a problem. Many eminent chemists—such as Dr. Ure and others,—were consulted, but they afforded no satisfactory information to work it profitably. Some years ago an association, named "The New Jersey Zinc Company," was formed for the purpose of manufacturing the zinc ore into paint. But as white lead is the head, front, and basis of almost all our paints, it was discovered that unless the zinc ore could be reduced to the white oxide. the company would fail in one grand object of its organization. Why? Because white lead is an unhealthy and dangerous paint, to use, both for painters and those who have to dwell in newly painted houses, while white zinc is a more beautiful paint, more enduring than white lead, and is quite healthy to use. The Company, about two years ago, erected works on the Passaic river, near to Newark, N. J., for the manufacture of the ore into white zinc paint, and various shades, from a light cinnamon to a cinnabar color. The Company has learned much since it first commenced operations; many difficulties have been overcome, and new inventions (elicited by that profitable teacher, necessity) have at last crowned all the efforts of this Company with well-deserved success, and now it is on the high road to become one of the most prosperous associationsin the world.

The ore is taken from a distance of about thirty miles to the works, which are built on the Passaic for the convenience of getting cheap fuel, &c. The ore is slightly roasted, then stamped in a stamping mill, and placed in reducing furnaces, submitted to a certain degree of heat, and then the zinc, being volatile, passes away through pipes into bags of twilled cloth, which retain the white zinc, while the air, being more subtle, passes through the pores of the cloth. To perform this operation, exhausting machinery is placed in the reversed position to that which it is employed in forcing air into furnaces. The iron and manganese are retained in scoria in the furnaces, but the iron ore is very good, and makes a far stronger metal than the best Swedish iron. We have described the process of making the white oxide—it is a beautiful and ingenious one. Of course it would not answer for some other kinds of zinc ores. A patent was grantedfor it to S. T. Jones, and the claim was published in our list a few weeks ago.

The white oxide of zinc is mixed with oil, like white lead, by grinding, and then packed in casks for market. We can speak from knowledge, and say that it is far more beautiful than white lead. It is our opinion that a minute quantity of chlorine gas, which passes off with the air, helps to give the beautiful white color to the zinc. The sales of the Company amount to seven tons of paint per day, and in a few years it will amount to twenty tons. We believe that the ore from which the New Jersey zinc is made, is the only kind yet discovered which is free from arsenic or sulphur.

The Municipal Fire Telegraph.

[Concluded from page 219.]

The signal stations of Boston consist of cast-iron boxes of great strength fastened to the outside of buildings and connecting with the wires above by means of insulated conductors, enclosed in an iron gas pipe. Each of these boxes contains a signal key for police communication, and also for some uses of the Fire Department—an electro-magnet included in the circuit, and having an armature carrying a hammer, which raps against the side of the box, as a means of return communication by sound from the central station,—a discharger of atmospheric electricity, which has already been mentioned, and a signal crank, by which the existence and location of a fire is made known to the centre. The signal crank carries a circuit wheel, either on its axis, or at a slower rate by means of gearing, which wheel has the proper number of teeth or cams on its periphery to lift a spring and break the circuit in such a manner as to signalize the number of the Fire District, and also the number of the station, to the centre, at each revolution. The number of the Fire District is given in dots, that of the number of the station by a combination always of dots and lines. Thus the record produced at the central station, by each rotation of the crank in the box, marked District No. 3, Station No. 4, might be as follows: . . . . — .

The name of the person keeping the key of each signal box is marked upon the door. In case of fire the box is opened, and the crank turned half a dozen or a dozen times. The locality of the signal boxes is carefully chosen, usually opposite to a gas lamp. The central station in Boston is the City Building, from a bracket on the roof of which the wires radiate in all directions. Here the receiving instruments connected with the signal circuits, the transmitting instruments connected with the alarm bell circuits, the testing instruments, and the batteries for the whole system, are placed. An operator or watchman, the only one required for controlling the whole system, is also stationed here.

The instruments receiving the communications, either of Fire or Police, from the signal boxes, consist, first, of three receiving magnets mounted on the same stand and connected, one with each of the three signal circuits; and, second, of a triple office alarm or call and a Morse register, with three electro-magnets, levers, and pen points, marking side by side on the same strip of paper, which alarm and register are operated by the receiving magnets and a local circuit. The office alarm consists of three powerful electro-magnets, each striking a blow by means of a hammer connected with the armature on a bell of a tone different from the others. A separate alarm and record is thus obtained for each signal circuit.

The signal of a fire having thus been received at the central station, the operator turns at once to the transmitting apparatus connected with the alarm bells, which consists of the district key-board. This instrument, in its simple form, is a circuit cylinder, carried by clock-work, with keys marked with the district numbers, which bear upon the cylinder when depressed, and complete the circuit at intervals, so as to produce the district signal on the bells with proper pauses, so long as the key is held down. The district key-board may also be constructed in a way similar to the striking motion of a common clock so as to complete the circuit the requisite number of times when the key of each district is depressed by the action of a gathering pallet. This gives less numerous surfaces of electrical contact, and is therefore preferable, and has been adapted to the system at Boston by Mr. Farmer. It has seven keys for the fire districts, one key for continued blows at two seconds interval, or fast ringing at the commencement of an alarm, and one key which gives the signal *one, one-two* for "all out," which is always to be struck upon the bells, when a fire is extinguished, to allow the engines which have not reached the fire to return home. There are also two spare keys not yet appropriated.

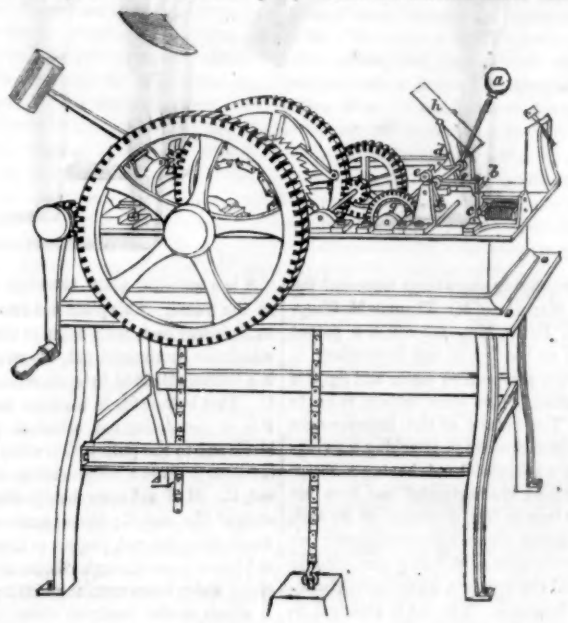
For the sake of economy in battery power, the current is thrown on to the three alarm circuits, separately, but in rapid succession by the arrangement of the key-board. The effect of this upon the synchronism of the bells is inappreciable, when compared with the effect of distance upon the sound of different bells.

An alarm bell register is connected with the district key-board, having a dial for each alarm circuit. This is so constructed, by means of an electro magnet armature and ratchets that a hand on each dial is carried forward one-thousandth of a revolution each time that the battery current is sent out to the alarm bells. It is consequently known in the office how far the various striking machines have run down, and if it is necessary to wind them in anticipation of their usual weekly time.

The testing apparatus consists either of a common clock or an electro-magnetic clock, so arranged as to send the current of a testing battery over all the circuits, once an hour, or more frequently. Each circuit communicates with an electro-magnet having an armature carrying a hammer, and striking a bell when the circuit is completed. At the City Building, in Boston, an electro-magnetic clock thus tests the continuity of all the circuits by a chime of six bells of different note, at the regular striking time of the clock. The battery employed is purposely so feeble that it will not set off the striking machines in the alarm belfries.

The keys upon which the clock operates as above, are attached to a single board, and are also finger keys, by which the circuits may be tested at any intermediate time. The three testing keys of the signal circuits have also the important function of police communication. By means of these communication can be held backwards and forwards between the central station and the 40 signal boxes. The signal battery connected with the closed signal circuits, at the central station, is about twelve Grove cups. The battery connected with the alarm circuits, and sufficing to liberate the hammers of all the bells, is about 35 Grove cups, though a smaller number may easily be used. This battery, in the south circuit of three and a half miles, liberates nine bell hammers at the same instant.

There are nineteen alarm bells included in



the three alarm circuits, which are called into action at will by means of the electric current. In the belfry of each of these is a powerful striking machine which will now be described. This resembles the striking movement of clocks, made, however, to strike only one blow, and having, as its chief peculiarity, the very beautiful secondary electro-magnetic apparatus for the liberation of the detent, contrived in 1848, by Mr. M. G. Farmer, and for which, or its equivalent, in a weight or spring, he has applied for a patent in its application to machinery. The figure represents the precise form of instrument as well constructed by Howard & Davis for the city of Boston.—For striking the large church bells they are at present carried by weights of about twelve hundred pounds, and raise a hammer of 45 lbs. on a handle four or five feet long. The hammers strike through an arc of from two to three feet, with a force equivalent to 800 lbs. falling one inch.

The frame is a most substantial casting. The electro-magnet will readily be recognized, with its armature attached to an upright lever at *c*. The legs of the electro-magnet consist of half-inch soft iron, surrounded with coils of insulated copper wire No. 23, which are three inches long and two inches in diameter. *a* is a falling arm, weighted at the top, which is supported in an upright position by a horizontal lever, resting on the top of the armature lever at *b*. When the armature is attracted to the magnet, the weighted arm, *a*, falls over until stopped by the adjustable rest in front of it. In falling, a little lever, seen attached to the same axis, raises the latch-shaped detent, *d*, by means of the pin connected with it. The arm carrying the pin, *e*, attached to the same axis with the cam, *g*, and connected with the train of wheels of the striking machinery, is thus liberated, and commences to revolve on its axis. In so doing the cam, *g*, swings forward the bar, *f*, attached to the axis of the falling arm, *a*, which is thus raised to its original position; the horizontal lever catches again at *b* if the armature has been released, the detent, *d*, falls, and the pin, *e*, is arrested at the end of one revolution. This occupies two seconds, and in the meantime the weight of perhaps 2000 lbs. has fallen an inch, and a single blow has been struck by the hammer. If the armature were not released from the attraction of the electro-magnet, the horizontal lever would not catch at *b*, and the machine would continue to strike, until the circuit, influencing the electro-magnet, was interrupted. This indefinite and undesirable mode of striking would be produced by holding down the alarm key at the central office. To obtain single blows, for the purpose of definite alarm, the circuit must be completed momentarily at suitable intervals, which is best effected by means of the district key-board. The fly-wheel of the clock-work is shown at *h*. The hammer represented in the figure is usually placed in a belfry above, connected with the hammer lever by a wire.

As part of the bells in the Boston system are also rung for other purposes, an automatic shut-off or switch is connected with the bell-frames, so that the battery current is diverted from the coils of the striking machine when the bell is in motion, and strikes a little electro-magnetic call to inform the sexton that there is an alarm of fire, to which he should give precedence, by ceasing to ring.

An apparatus has been described by Messrs. Channing and Farmer for furnishing a constant supply of condensed air by means of the water under pressure in the pipes in cities, which may be applied either to carry a bell hammer, by means of an air engine, or, still better, to operate an air whistle, by means of the telegraphic circuit. The water metre of Huse, or other water engines may also be used to lift the bell hammers. The advantage of such an application is the constancy of the power without the necessity of winding up and consequent limit of force and number of blows.

The experiments recently made in Boston show that the signals are instantly received at the central station from the most distant signal boxes, and that a reply is at once given on the bells with precision and certainty. The striking machinery is not yet adjusted so as to develope the whole amount of sound which can be obtained from the largest bells. As alarms are given by tolling hammers in New York and other cities, no difficulty will be found in bringing out any required amount of sound, in accordance with simple mechanical laws. The telegraphic and electro-motive part of the system, which is the novel part, is perfect and unerring in its action. It is worthy of notice that the circuits in Boston have not been interrupted by any casualty during this winter of unprecedented severity, since they were first completed in December.

To show the operation of the system, let us now trace the alarm of fire which, in describing the signal box, we supposed proceeded from district No. 3, station 4. The operator at the central station on receiving the signal immediately passes over to the district key-board and holds down the key for fast ringing. All the nineteen bells immediately begin to strike two-second blows. After a minute or two the operator raises his finger, and then depresses the key marked 3. The bells now strike the district signal of three blows at intervals of two seconds and them pause six or eight seconds and repeat, as long as the key is held down. Very soon a hurried signal is received over one of the signal circuits. This comes from the random rapping of an engineer on the key in one of the signal boxes, and is understood by the operator as an inquiry for the number of the station from which the alarm proceeded. This the operator immediately communicates by counting four raps by means of his testing key, on the electro-magnet in the signal box from which the inquiry came. The engineer now knows the locality of the fire within fifty rods, and heads the engines directly to the spot.

Meanwhile the fire is perhaps easily extinguished. The engineer in command sends to the nearest signal box, and taps *one, one-two—one, one-two*, on the key. The operator at the centre receives the communication, and forthwith depresses the corresponding key of the key-board. The nineteen bells at once strike the signal a few times, and the engines in all parts of the city turn back.

By a multiplication of signal stations, and a suitable provision of bells, the Telegraph Alarm system becomes instantaneous, universal, and definite in its operation. The experienced gained in the construction in Boston, will make the application in other cities and towns comparatively easy. In cities like New York, where there are a few large alarm bells, the telegraphic machinery can be applied with great advantage, so as to strike a blow of any required force, and to bring the bells into operation separately or together, so as to limit or extend the alarm. Only one person is required at the centre to wield the whole of such a system, which provides also for a vital organization of the Police body throughout the whole Municipality.

The expense of the system, completed, in Boston, may be estimated at $15,000. For small towns a similar organization might be effected for $1500 or $2000, and for the largest city, as New York, the work might be constructed in the most perfect and elaborate manner, bringing every building, as in Boston, within fifty rods of a signal box, for about $50,000.

The government of the city of Boston deserve credit for the liberally with which they have thus brought a new application of science to the test of construction. Great credit is also due to Mr. Farmer, the superintendent of construction, in addition to his original contributions, for the practical direction by which the parts of so extensive a system have been brought into harmonious action.

Disease by Bank Notes.

The Cincinnati Enquirer, in noticing the statement of Dr. Buckler, of Baltimore, that small-pox is often communicated by means of bank notes, says:—

"The teller of one of the banks of Columbus, an estimable young man, contracted the disease by handling a batch of bills which had been transmitted from this city, where the small-pox was then quite prevalent and in malignant form. The young man died—and by such a seemingly harmless communication, was that loathsome pestilence the cause of a family losing their main stay in life."

NEW INVENTIONS.

Improvement in Slat Doors.

Mr. William Rippon, of Providence, R. I., has taken measures to secure a patent for an improvement in doors. The invention deserves the attention of that numerous and intelligent body of our citizens, "the carpenters." Its nature consists in the arrangement of loose adjustable slats in grooves, along the front, top, and back edges of the door; all these slats have spiral springs attached to them. The springs are for the purpose of adjusting said slats by the circular edges of the door as it is being thrown wide open, in either direction, in or out. These are vertical slats arranged and working in grooves along the front edge of the door, and have attached to their top and bottom ends, horizontal connecting links, which connect the slats to horizontal rods united together by a vertical one, and working on fulcrum pins, passing through their centres. By means of these levers, springs, &c., the loose vertical slats, when the door is being opened or closed in either direction, are, by the friction of the circular edge of the door, made to move horizontally back and forth in vertical longitudinal grooves cut in the frame of the door, and thereby allow of the door being opened in both directions, inwards and outwards. When the door is shut these slats spring or adjust themselves along the edges of the door, and keep the wind from passing through the crevices, which are left between the top, front, and back edges of the door. They also keep the door firmly locked in its place when shut; the door cannot be opened without force being applied to the rods to operate the springs of the slats. The horizontal slats turn loosely on hinges, which are fixed to a cross piece, turning on a rod secured in the frame of the door. To the sides, near the back end of this cross-piece, a cord and weight is attached. The cord and weight, with the spiral springs, operate on the cross-piece and horizontal slats, in a similar manner, when the door is being thrown open, as the levers and springs before described operate on the vertical slats.

Improved Printing Press.

Mr. Henry Underwood, of Canandaigua, N. Y., has taken measures to secure a patent for a useful improvement in the hand printing press. The object of it is to afford a most excellent press to many printing establishments in the country, where there is not enough of work to employ a large power press, its price of construction being very little more than that of a common hand press, while the work which it performs is much greater and equally good. It performs nearly double the work of the present hand press, for its operation is not suspended while the sheets are being put in and taken out. The type bed is stationary; a reciprocating carriage is furnished with friskets at both ends for holding the sheets, consequently, when one sheet is receiving the impression, another sheet is being put on; so from side to side the sheets are fed, printed, and delivered.

Improved Spring for Carriages.

Mr. John Lamb, of McDonough, Chenango Co., N. Y., has taken measures to secure a patent for an improvement in springs for carriages and other vehicles. Vulcanized india rubber springs are employed; one end of each is secured in the top part of standards which are attached to the bottom of the wagon; the other ends pass over friction rollers secured in the top part of standards which are attached to the axletrees; they run down and are secured fast in the lower parts of the said standards. These springs have sliding clamps on them for regulating their expansion and contraction for light and heavy loads.

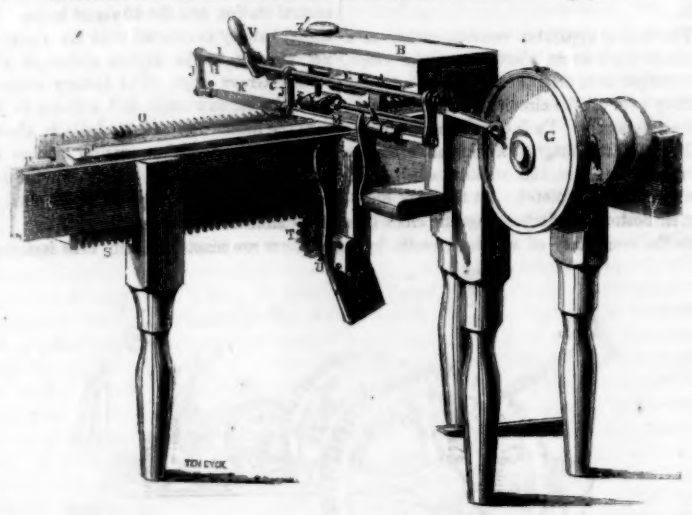
Improvement in Drying Stoves.

Mr. Nathan Buchanan, of Johnston, R. I., has taken measures to secure a patent for a very excellent improvement in drying stoves. The invention is a most excellent one for drying staves and timber of all kinds. The nature of the improvement consists in constructing drying stoves so as to dispense with the use of a chimney entirely, and employing the products of combustion mixed with heated air for drying purposes. This invention, as applied, economises fuel, and, at the same time, the timber is rendered more enduring by the substances which heat and dry it. By the manner in which the furnace or furnaces of Mr. Buchanan are constructed, a perfect combustion of the fuel is certain, so that what is termed "the smoke" is consumed. Where wood is used for fuel, a portion of pyroligneous acid escapes in vapor, but this has preservative qualities. A low heat can be employed as desired, so that for smoking and drying fish and hams with suitable fuel, the improvement is as useful and applicable as for drying timber.

Improvement in Telegraphs.

Mr. John M. Batchelder, of Boston, has invented a new improvement in chemical telegraphs, whereby the paper prepared with the prussiate of potash is not used at all, but the common pink tissue paper which can be purchased at the stationers. It is stated to be a great improvement.

PATENT SAW-FILING MACHINE.---Figure 1.

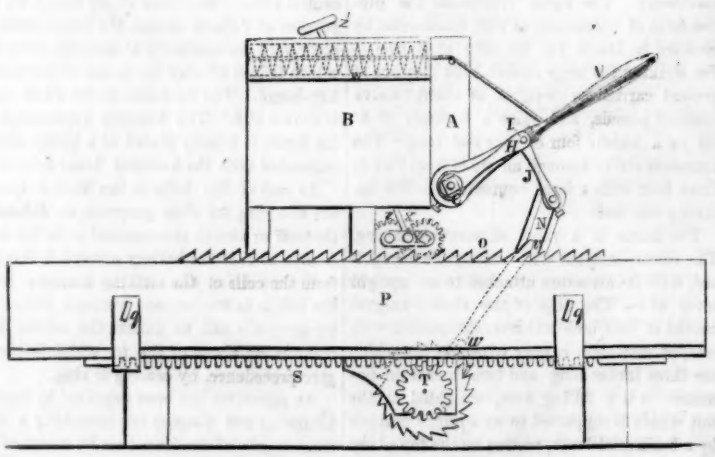


The accompanying engravings represent the Saw-Filing Machine of Mr. Thomas M. Chapman, of Old Town, Me., for which a patent was granted on the 3rd of last September.

Figure 1 is a perspective view, and fig. 2 is a side elevation. The same letters refer to like parts. The nature of the improvement in this machine consists in attaching a swinging frame to a horizontal rod, having a reciprocating motion; the horizontal rod is so arranged as to turn in the direction of its axis, and the swinging frame has consequently an up-and-down motion, and, being connected to the horizontal rod by joints, it also moves backwards and forwards. The file is attached to the swinging frame, and is so arranged as to turn on its axis, and is adjusted or kept in any desired position by a handle. The saw to be filed is placed between clamps and secured by screws; the clamps are moved by means of a rack placed under them, in which a pinion works; on the shaft of the pinion is placed a ratchet wheel, which is operated by a pawl and lever. By the improved arrangement, the same motion is given to the file by mechanical devices as is given by the hand.

A is a metallic plate attached to block B on the frame. This plate has two projections on its lower part, with holes in them, through which the horizontal rod, C, works. There is a button attached by a set screw to the rod, C. This button fits in a recess in a block, E. F is a connecting rod attached to the said block and to the pulley, G; when this pulley revolves it gives a reciprocating motion to the rod, C. H H are arms firmly attached to the ends of the rod, C; these arms extend outwards from the rod, project a little upwards, and have holes through them at their outer ends; these holes form the bearings for a rod, I, which works freely in them, and may be worked backwards or forwards. J J are arms attached to the rod, I; the lower part of said arms support the file, K. the handle, L, and shaft, M. The file handle and shaft turn on their axis. The handle, L, is prevented from moving, when the file is in motion, by the arm, N, which is attached by a screw on the lower part of the frame; its upper part has a slot in it, which works in a recess in the end of the handle. The shaft, M, passes through the centre of the handle. The file rests on a

Figure 2.



pivot, *o*. O is the saw, which is secured between the clamps, P P′ by the screws, *q q*; the inner clamp, P′, has a groove or recess cut in it, in which the rest, R, works. The clamps with the saw move forward on the rest, R. S is a rack attached to the under side of the clamp, P′. The pinion, T, meshes into it. U is a ratchet wheel, which is turned by the pawl, *w*, which is attached to the lever, *v*. When this lever is depressed, the pawl catches into the teeth of the ratchet wheel, turns, it, and also the pinion. T, and as this pinion meshes into the rack, S, the clamps and saw are moved forward to file tooth after tooth. V is a lever for depressing the file, K, and bringing it down between the teeth of the saw. W is a spiral spring at the end of the frame, to which a cord is attached, and connected with the lever, V; this spring is for the purpose of elevating the file. The rod, I, with the arms, J J, constitute a swinging frame. On the back of the frame is a bevel gear, X Z, which gives motion to a smoothing revolving burr, Y, on a small shaft, to level the teeth of the saw before the file acts. The pulleys behind G give motion to the burr.

The saw, O, is placed between the clamps; the rotation of the pulley, G, gives a reciprocating motion to the file. The swinging frame being attached to the rod, C, has also a reciprocating motion. The file is brought down edgewise between the saw teeth by the lever, V, with the left hand; the rod, C, is adjusted to suit either the front or back of a tooth, by turning the handle, L, with the right hand. The front part of a saw tooth is nearly vertical, while the back forms an angle of about 45°. The necessity of having the file turn on its axis, so as to accommodate itself to that angle, is obvious. The swinging frame having a motion towards and from a person, allowing him to stand before the machine, greatly assists to the perfect adjustment of the file to the teeth. The handle, L, does not move with the swinging frame in its reciprocating motion; it is secured by the arm, N; the shaft, M, moves through the centre of the handle. The file is kept in its proper position, while filing the front or back of a tooth, by having the right hand placed on the handle L, the left hand being engaged in holding down the lever, V, and thereby keeping the file down between the teeth of the saw. The saw is moved forward, as each tooth is filed, by working the lever, *v*. The swinging frame of the file is raised to allow the saw to be moved forward. The improvement is a good one, and should receive general attention.

More information may be obtained by letter addressed to Mr. Chapman, the patentee.

Revolving Last Holder.

Mr. H. G. Dewitt, of Napanock, Ulster Co., N. Y., has taken measures to secure a patent for a very useful improvement for boot and shoemakers' use. It consists of a holder to retain boots and shoes on lasts, while making. The holder is an apparatus placed on a bench, in which the last, with the boot or shoe on it, is fixed, so as to turn round, or change its position in any way for the operative to work on the boot most conveniently, and which will enable him to stand and work at the bench, and at the same time afford him every facility for operating the shoe or boot that he now has by sewing or pegging it on his knee. This apparatus, to all the shoemakers who use it, will tend to promote health and lengthen out the years of life. It is a philanthropic invention in every sense of the term. It will relieve those shoemakers who suffer from pain in the chest, and the holder is so fixed that it can be let down, and when the operator may be tired of standing he can sit down and work.

Improved Ship Block.

Mr. C. H. Platt, of the city of New York, has taken measures to secure a patent for a good improvement in ship blocks. He secures the cheeks of the blocks the required distance apart by metal plates attached to the cheeks of the blocks by transverse bolts, hoops or bands.

A Singular Diet.

A correspondent of the Chicago Tribune tells of a little girl ten years of age, whose only subsistence since infancy has been sugar and milk—some obstruction or disease of her throat having led her always to refuse any thing more substantial. She is stated to be as large as children usually of her age, and as healthy, bright, and active as those whose food would be considered more invigorating. —[Exchange.

[Some people may doubt the above, but we know of a stronger case still. We once knew a man over 40 years of age, who weighed 180 lbs., was active and well built—a farmer—who had never partaken of what we call solid victuals, from the time he was nine years of age. His principal food was milk without sugar, and sometimes soups. His name was Whitelaw.

On Thursday last week an explosion of a boiler at the paper factory of Messrs. Demar, Muir & Kay took place at Trenton, N. J. One man was killed. The boiler was used for boiling rags with potash and lime. In some way or other, we have no doubt, but an explosive compound was formed, which produced the lamentable result.

We see it stated in some of our exchanges who are posted up in the conciences of the Senate, that the committee on patents in the Senate, have reported unanimously in favor of the extension of McCormick's patent for the reaping machine.

Scientific American

NEW-YORK, APRIL 3, 1852.

The Known and Unknown.

Great though man is, intellectually, still all the knowledge which he possesses is as vanity, compared to the great mysterious unknown—that which he does not know. He makes the lightning his messenger, and sends words of hope, love, or fear to distant places on its fiery wings. He takes iron from the mine and wood from the forest; of the one he makes his steed, and the other his driver, and away he roars on the iron track faster than the eagle cleaves the air. He throws his iron bridge over the sea; and his iron cords span the yawning chasm, where Niagara's waters run dark and deep. The ocean billows are smoothed by the wheels of his steamships; he pierces through the Alps with the chisel and drill; he makes his pathway beneath great rivers, and walks dry-shod beneath the keels of huge ships. All this he does, and much more, by the force of his splendid mind—that constructive faculty implanted in him by his great Creator. But great though man is intellectually, and vast though the powers of his mind are, to comprehend and plan; extensive as is his knowledge of things in earth, water, air, and sky, still all this but teaches him that he knows nothing in comparison with that which is far beyond his ken.

The astronomer hath constructed his telescope six feet in diameter, and with it he seeth clearly five hundred times farther than he can with his naked eye; with it he hath made many discoveries in the starry heavens, for he can tell the height of the mountains and the depths of terrific craters in the moon; he hath counted other systems beside our own solar corner of the universe; but these things only impress more strongly upon his mind the simple fact, "he is but a babe in knowledge." He sees double, triple, and quadruple stars; one red, another blue; one crowned with revolving rings, and another oscillating like a pendulum; and viewing these immensities, the conclusion is forced upon his mind, that this earth, in the universe of worlds, is like a cork on the great ocean, and himself like a butterfly which dances in the sunbeam.

It may be acknowledged that man can know but little of those immensities which are so far removed from the sphere in which he dwells, but it is different with those things which are brought under his strict observation. There is some force in this remark, still the knowledge which man has accumulated in all the generations of his existence, forms but a small mound in comparison with the unknown. No machine hath yet been built which can cleave the air like the swallow, or dwell continually amid the storms of the ocean like the "petrel." No steam or other engine ever constructed, can give out such an amount of power every day, with three pounds of fuel, as the human machine, which, in a full grown man, consumes only three pounds of food. In apparently very simple things we know comparatively little. Who can detect that influence in a bank note which carries disease and death from an infected person to another, hundreds of miles distant. Plagues and fearful diseases are carried on the wings of the wind, but no chemist, by the most refined analysis, has been able to detect the subtle destroyer, which tells man "he dwells in a cottage of clay and is crushed before the moth."

We enter the flowery garden, and one sense tells us there are substances floating in the atmosphere which have been cast off by the rustling rose and geranium, to give pleasure to the mind; but those substances cannot be seen by the eye, heard by the earn, or felt by the hands; they are too fine for the scale of the chemist—his weights and measures are yet far too coarse to weigh an atom or circumscribe its dimensions; and here may lie some of those secrets which, for want of a better term, chemists give the name of "isomeric compounds." In the organic cell of the loftiest and lowliest known existences, there is a world beyond the search of the most powertul microscope that has yet been constructed. If there is in an overpowering sense of man's ignorance, derived from an examination of the immensities of the universe, as strong a sense of our ignorance is derived from the contemplation of a single molecule of matter,—the universe of a drop of water—a single organic cell.

It is not to be supposed, however, that because many things are now hidden and secret to us, they will always remain so. There is a limit to the mental grasp of man—beyond it he cannot go, but the world is full of wonders yet to be discovered—nature hath already revealed many of her secrets, and she will tell us many more. The qualities of a great and good discoverer and inventor, are, a good judgment,—common sense—reflection, industry, observation, and arrangement. Newton was pre-eminently distinguished for those qualities; and by the falling of an apple, his observing mind took up that which, to all others had, since the world began, excited no curious emotion, and it led to the discovery of that law which binds the sweet influences of the Pleides, guides the planets in their courses in the stellar heavens, and which, as hath been well observed by an eloquent astronomer,—"conveys the thrill of the thrush's song to the remotest star in the universe." Every man, then, who has the least ambition to extend the borders of our knowledge—and oh what a field there is before us still,—should observe, reflect, arrange, and gather up facts,—for science is but a collection of well-arranged facts.

A Few Words for Farmers.

As we have always a practical object in view in our disquisitions, we now wish to direct the attention of our farmers, for a few moments, to the subject of agriculture. The great discoveries yet to be made in agriculture will be the result of strong good sense, close observation, and study of natural phenomena. One very eminent chemist (Liebig), who has devoted nearly his whole attention to agricultural chemistry, has changed his opinions more than once on certain questions relating to agriculture, especially fertilizing substances. Although chemistry is of vast importance to the farmer, a most excellent chemist would make but a very poor farmer if he did not pay attention to more than the mere chemistry of his business. A plant, for example, is analyzed, and is found to be composed of silicon, potash, carbon, lime, and nitrogen; one says, "I shall make my fertilizers of such a compound;" he does so, and fails to obtain satisfactory results; why? Because he has not been a profitable observer of nature's operations. The human body is composed of nitrogen, carbon, water, phosphorus, lime, silicon, and some other substances; carbon, nitrogen, the phosphate of lime, but especially water, are the principal substances of which it is composed, and carbon and water form the greatest portion of its nourishment, as the carbon is the main substance of that low combustion which keeps up the heat of the body: yet who would be so foolish as to prescribe anthracite coal, phosphorus, lime, and nitre for his daily food? No one. We cannot tell why it is that man must plow, sow, and reap grain, and why he must slay the ox for his food, when the same substances of which his body is composed, can be dug from the dust beneath his feet; we only know that such is the fact. The grain of wheat requires sunshine, moisture, and the blanket of mother earth, to make it germinate, grow up, and come forth again in the golden harvest to gladden the heart of man. These operations of nature to produce certain results we are acquainted with, and have learned the facts by observation. All the knowledge of the farmer must be obtained by experience and careful observation. His business is a practical one; not that of a dreamer or speculator; his eyes must be open to see and his hands always ready to do—never afraid to try an experiment, and never too hasty to adopt a theory without experiment. Experiment alone can determine the value of fertilizers, and the best mode of farming—such as the best modes of applying fertilizers—the times, soil, and seasons most suitable to do so. It is our opinion that every farmer should have a few acres of his farm set off for model experimental agriculture; and this period of the year, we believe, is the proper time to commence such a system, hence our present remarks.

The Hair.

Since the custom of wearing long hair and beards has been adopted by so many of our people, during the past two years, and since the Seer Davis has had revelations on the subject from the Spirit World, it may not be uninteresting to take a look backwards to other days. Among the early christians the custom of wearing long hair among men was denounced, and yet, strange to say, the Roman painters, in all the pictures of the Savior, depict him with long waving ringlets. In very ancient times long hair was a mark of beauty among men, as we read, in the case of Absalom, the son of Israel's Shepherd King. Among the Greeks and Romans the dandies wore long hair, and this trait distinguished the patrician Cohort of Pompey the Great, which was routed so terribly by the short haired veterans of Cæsar at the battle of Pharsalia. All the nations in a savage state—the men—wear long hair. The hair was part of the covering of the ancient Irish, at least this is recorded by the old chroniclers. It was esteemed a peculiar honor among the ancient Gauls to have long hair. Julius Cæser, after subduing them, made them cut off their hair as a token of submission. The keepers of our State Prisons do the same now to their prisoners; they like to follow in the footsteps of great predecessors. In France it was long a peculiar mark and privilege of kings and princes of the blood to wear long hair artfully dressed and curled. All others were obliged to cut their hair in accordance with their rank and condition. In 1096, the Christian Church passed an edict importing that such as wore long hair should be excluded from coming into the church while living, and not be prayed for when dead.

In Queen Elizabeth's time it was common for the ladies to wear false ringlets of various colors, a mixture of fair, brown, and black. This was certainly a curious custom. In the reign of Charles II., all the dandies wore wigs powdered, and for a long time afterwards, both old and young, men and women, powdered their hair with fine flour. This custom was in vogue during the American Revolution. It was an abominable one certainly. In England all who wore powdered hair had to pay a tax (it may still exist), to government. The ridiculous custom of the English chancellor wearing a wig while on the wool-sack, is a relic of the old times. An engraving of Sir Edward Sugden, the new Lord Chancellor of England, appeared in a late number of the London Illustrated News; he had on his robes of office and his ponderous ugly wig. All the portraits of the leading characters in the Augustan Age of English literature would lead us to believe that such men as Addison, Newton, &c., were perfect Absaloms.

The monarchists, named Cavaliers, in the reign of Charles I., wore long hair; the Puritans wore short hair, and were called whigs. During the time of the United-men in Ireland, the revolutionists wore their hair short, and were named "Croppies." The cut of the hair also distinguished the band of young Parisian Frenchmen who had vowed hostility to Robespierre. At the present day the cut of the hair is followed by every man after his own fashion. It neither indicates rank nor religion, but it oftentimes proclaims the peculiar temperament of the man.

The most difficult question connected with the hair is the different color in different people. The Africans, Hindoos, Chinese, and American Indians are, in respect to their hair, all black. Some are lank, some curled, and some of frizzly quality. Among the nations of Europe there is every variety of color, although some nations are more distinctly uniform than others. What are termed the "Celtic, Scandanavian, and German races," have every variety of color, such as fair, red, and black, but at the present day none of these races are to be found pure, except it may be in a few small spots, such as in Finland, Saxony, and the Highlands of Scotland, and yet in those places, we believe there are mixtures. Among the Anglo-Saxon race there is every variety of color, but the Anglo-Saxon race is not a type, but a mixture of the Angles (Scandanavians), Saxons, Celts, and Romans, and yet of the Celts there are various distinct tribes. It is generally supposed that the fair and red races are Finnic and Saxon. The Danes were esteemed the red race in olden times, but the custom among some races in the East to color their hair red, at the present day, is an evidence that they are descended from the Finnic race which at one time conquered Egypt, and whose likenesses are portrayed in the old tombs. It is not possible to classify the European nations by the color of the hair, for they are all a hotch-potch of mixtures, although there are great varieties of language among them.

The wooly heads belong exclusively to Africa, but Smith says, in his work on the Human Races, that there is also a wooly-head race in the East Indies.

No person can account for the differences in the hair of different nations; we know that such and such races have such head marks, and we know also, that they are distinct and characteristic, for a mixture of races is sure to produce a corresponding change in the hair.

We presume to state that as no man has the choice of his own hair, when born, he must just take it as it happens to come, and make the best of it, according to circumstances, to suit his fancy, if he can; and if he cannot, to bear it like a philosopher.

Recompense to the Heirs of Woodworth.

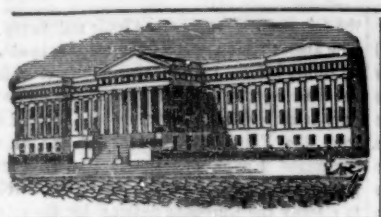
We have seen it stated that the heirs of the Woodworth Patent do not receive remuneration for their father's invention. Well, then, whose fault is it? Are the people of the United States to be taxed to support a great overgrown monopoly—keeping up a number of noble famalies in our land, because the heirs of Woodworth have been so foolish as to sell their rights at a low price? That is a queer way of bringing up arguments for the perpetuation of evils. A number of fortunes will be made out of the Woodworth Patent yet in the four years which it has to run. There can be no doubt of this, we believe. It is not true, either, that the heirs of Woodworth have not been remunerated.

Equinoctial Storms.

At the late meeting of the American Association for the Advancement of Science, which was held in Albany, N. Y., last summer, Prof. Loomis, of this city, read a paper on Equinoctial Storms; the conclusions arrived at were that the common opinion respecting regular storms at the equinoctial seasons, was erroneous, that it was like the vulgar notions of planting potatoes at full moon—and all such nonsense. He had kept a record of the kind of weather which had occurred during these seasons for a number of years, and that was the data for his conclusions. One or two members of the Association corroborated his view, but Dr. Hare, of Philadelphia, expressed a different opinion. He always expected, and always experienced, rough weather during the equinox terms. On sea he had experienced it, and the general opinion, he believed to be correct. The present equinox has been a stormy one, and affords testimony in favor of vulgar opinions about the storms. It is true that on the 22nd of March, last week, we had no rain in New York City, but we had plenty on the 23rd. We have noticed that, what are termed equinox storms, do not take place on the very days (22nd March and September), but generally before that particular time in March, and after it in September. We had a great deal of stormy weather within the past two weeks. On the 17th inst. (St. Patrick's Day) we had a most terriffic snow storm,—it was a complete tempest.

Terrible Accident.

On Friday last week, a lamentable accident occurred near this city, on the East River, near Hurl Gate. Mons. Maillefert, who has been operating for some time on the rock named the "Frying Pan," intended to make 4 blasts at low water, and had made one; while attempting the second, the accident occurred. Each charge is a cannister of 125 lbs. of powder, and several of these cannisters are taken into a boat, and one at a time is let down upon a rock. When one is let down, M. Maillefert takes the end of the wire which is attached to the cannister and rows off, paying out the wire. When away far enough from danger, he closes the electric circuit of the battery, and the cannister explodes. The cause of the accident was owing to his touching the wrong wire.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 23, 1852

OMNIBUS STEP—By Josiah Ashenfelder, of Philadelphia, Pa.: I claim the application of the inclined covering or protector, to the outside of the omnibus door, as described, to prevent persons from standing, laying, or sitting on the steps, in combination with the brush, or broom, secured to the bottom of the covering, or protector, so as to open and shut therewith, for the purpose of cleansing the step or steps, each step, if more than one, requiring a brush or broom attached, together with a back board, to protect the inside of the step, as described.

SHOP AWNINGS—By W. H. Bakewell of New York, N. Y.: I claim the method of protecting the awning by the construction and arrangement of the cylindrical sheathing, or covering, in combination with the slat, in the manner and for the purpose as fully set forth.

MACHINES FOR STAMPING ORES—By Wm. Ball, of Chicopee, Mass.: I claim the combination of the washing basin, or contrivance, with the stamp rod and its bearing, so as to operate in the manner and for the purpose as specified.

I also claim the defective plate in the entrance spout or hopper, as combined with the same, and the mortar and stamper, and used for the purpose as specified.

I also claim the improvement in the stamp head, or the making of it with a greater stamping surface, on one side of its axis of rotation, than it is on the other, the same being for the purpose of preventing packing of the charge, as specified.

I also claim the mode of applying the stamp head to the stamp rod, viz., by means of the circular arcs, or curves, of the sides of the universal dovetail connection, with the wedge key, as described.

PLOWS—By E. Ball, of Greentown, O. (assignor to Isaac N. McAbee, of Canton, O.)—I claim connecting the beam to the plow irons, by means of a pivot and stay bolt, and adjustable standard, the whole being constructed and arranged as described, so that the front end of the beam can be set towards either side, or either extremity raised or lowered, without changing the height of the other, or both extremities raised simultaneously and equally, or unequally, substantially as set forth.

FRICTION PRIMERS FOR CANNON—By Wm. Ball, of Chicopee, Mass.: I claim the combining with the discharging string and tube of the primer, a cylinder or plug of leather, or other like substance, inserted and secured in the upper end of the primer, and having the exploding string passing through it, as set forth, the said plug or cylinder serving the purpose of a breech, to confine the charge; when exploded, as a protector of the sand paper and priming, against the absorption of humidity and as a bearing for the string to draw over, when pulled.

MACHINES FOR FELTING CLOTH—By George G. Bishop, of Norwalk, Ct. Ante-dated Sept. 23, 1851. I claim the method described of hardening the bat by alternate steaming and jigging, substantially as set forth, whereby one section of the bat is jiggered while an adjoining section is steamed, preparatory to being jiggered.

I also claim the process of steaming and jiggering two or more bats simultaneously, whereby much labor and time are saved, and the texture of the cloth is improved.

I also claim constructing a machine for jiggering felt bats, in such manner that it will subject successive portions of the bats to equal amounts of jiggering and then stop, whereby a greater uniformity of texture is secured in the cloth.

I also claim the arrangement of the steam pipes and adjutages in the steam chamber, substantially in the manner and for the purpose set forth.

MARINE SIGNALS.—By Thos. H. Dodge of Nashua, N. H.: I claim the employment for signalizing or indicating the course of a vessel, of two lights of different colors, attached to or hung in a cylinder or disc, which is capable of revolving on a fixed axis, so as to change the position of the lights: the position of either light, relatively to the other, being made to point the course, in any manner substantially as described.

[This is a most excellent invention. See engraving on page 145 this Vol. Sci. Am.]

PLANING MACHINES—By John Howarth of Salem, Mass.: I claim the reciprocating plane, for scoring the face of the board transversely, and reducing it to an uniform thickness, arranged substantially as described, in a compound frame, which carries the plane back and forth across the board, by a regular and positive motion, and back and forth lengthwise of the board, by a motion dependent upon the reciprocal action of the board against the planes, in one direction, and of springs against the frame in the opposite direction, substantially as set forth.

I also claim the method of smoothing the surface of boards or other lumber, by plane irons, reciprocating endwise, and operated in such manner, that the tendency of one to draw the board towards the side of the machine to which it is moving is counteracted, in whole or in part, by the tendency of one or more of the others, to draw the board towards the opposite side of the machine, these several counter tendencies being thus made to neutralize each other, substantially as described.

SWINGLE-TREES—By Chas Howard, of Madison, Ill.: I do not claim the ring and link; but I claim the flange, as set forth, wrought or cast, in combination with a ring and link, for the purpose of forming attachments, substantially in the mode set forth.

MACHINES FOR MAKING CORDAGE—By Wm. Joslin, of Waterford, N. Y.: I claim the application of the fan in combination with the pulleys, belt, gear, and bobbin, as a drag or take up, as described.

FLOUR PACKERS—Nathan Kinman, of Lewiston, N. Y.: I claim the friction roller clutch, constructed and arranged in the manner and for the purpose as set forth.

SMUT MACHINES—By Thos. H. McCray, of Madisonville, Tenn.: I claim the formation of a series of corrugated recesses within the periphery of the cylindrical casing of my improved smut machine, substantially of the forms represented, when the said cylindrical casing is combined with a rotating beater which has its beating surfaces, &c., arranged in position which incline obliquely to the radii of the beater, for the purpose of throwing the smut and kernels of grain into the said series of corrugated recesses in such directions that they will, in entering and rebounding therefrom, be brought in contact with their active surfaces, and thereby produce so great an amount of friction action, as to break up the smut and white caps, and polish the kernels of grain, without breaking the same.

CRACKER MACHINES—By John McCollum, of New York City: I claim the use of the bed plate, resting upon or supported by springs, or their equivalent devices, so that a yielding or receding action is obtained in the bed plate, while under the pressure of the cutters; or while the cutters are pressing down, for the purposes and in principle of construction and operation, as set forth.

ARTIFICIAL TEETH—Wm. S. McIlhenny, of Philadelphia, Pa.: I claim the formation of an artificial tooth, or teeth, from spar, silex, clay, sand, glass, or any material used for the purpose, into a suitable condition for the finishing furnace, by the simple operation of moulding, thereby avoiding the tedious and uncertain process of enamelling.

PAGING BOOKS—By S. E. Parrish (assignor to E. B. Clayton & Sons), of New York City: I claim, first, the use of the type plates, having channel ways and springs in their faces, and holes in them corresponding to the ten subdivisions of their peripheries and their inner circumferences divided into ten equal sides, in combination with a barrel having stop pins in its circumference, for the type plate, and a changing plate attached thereto, and ratchet wheel, cap plate, and pawl, and bent lever, for the purpose of operating a series of number plates, the said combination of parts being entirely distinct from any known mode for producing the same result (that is, counting), which I lay no exclusive claim to, the principle being well known, and I therefore limit my claim to combination of parts, substantially as set forth.

Second, I claim the use of the rod, lever, inking roller lever, and arm, in combination with the type wheel, substantially for the purposes as set forth.

Third, I claim the use of the inking roller frame and rod attached thereto, and rotating ink plate, in combination with the lever, slides, and type wheel and levers operating the same, substantially as set forth.

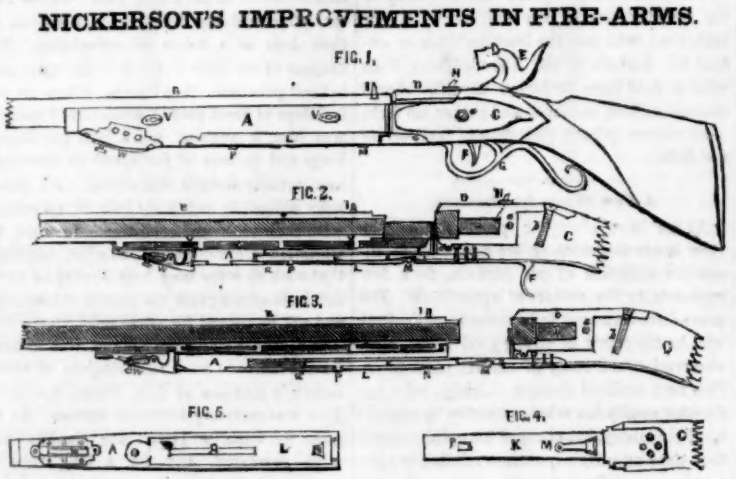
Fourth, I claim the bed, with guides attached thereto, in combination with the table and type wheel, substantially as set forth.

JOINTING SHINGLES—By Wm. Stoddard, of Lowell, Mass.: I claim the arrangement of the horizontal sliding boxes, which carry the jointing knives, by which they will cut the edges of any width of shingle, itself operating the devices for holding the boxes firmly, and in the proper position, while the shingle is being cut, as set forth.

AIR-HEATING STOVES—By J. M. Thatcher, of Lansingburgh, N. Y.: I claim the combination of the inverted domes or frustums, and plate, with the short tubes connecting them, substantially as described, for the purpose of effecting the connection between the lower end of the fire or draught flues, and carrying the air through them, to the spaces between the cylinders or tubes.

PARAFFINE OIL—By James Young, of Manchester, England. Patented in England Oct. 7, 1850: I claim the obtaining of paraffine oil, or an oil containing paraffine from bituminous coals, by treating them as described.

NICKERSON'S IMPROVEMENTS IN FIRE-ARMS.



Permit me, through the medium of your useful and widely circulated journal, to draw the attention of manufacturers and others to the valuable improvement in fire-arms of C. V. Nickerson, of Baltimore, Md., and to make a few remarks on guns of that description. The peculiar uses and advantages to which fire-arms made for loading at the breech can be applied, are various and important and may be defined under several heads as follows:—viz., for riflemen in bush fighting and mountain warfare, they are invaluable, as they can avail themselves of any obstruction barely sufficient to screen the body, load and fire with great rapidity, without unmasking, as is the case in using the ramrod. Mounted men, whether in the chase or fight, can avail themselves of its great facilities, without alighting or interfering with the management of the horse. In light infantry drill it often becomes necessary for troops to extend their line, and at intervals of several paces lay flat on the ground; after the first fire the operation of re-loading in that awkward position, with the ramrod, must be apparent to all; whereas, with a weapon of the above description, he may retain his ground and fire at pleasure. The ordinary musket can be altered to this plan at a trifling expense. Its advantages, when infantry have formed to receive cavalry, are manifest, as no matter how compact men may be forced, this method of loading enables them to fire with that rapidity which is absolutely necessary to check an assailing force. Fowling pieces can be manufactured with great beauty and economy; cartridges can be made to suit the bore of the gun with neatness and accuracy, entirely superseding the shot-bag and powder flask, and in the pursuit of game, with competitors in the field, the sportsman can load and fire much faster, and without that nervous excitability consequent on hasty loading with the ramrod. The spirit of invention cries "onward!" and even the school of the soldier must give way to the march of improvement; the day is not far distant when the old-fashioned method of "ramrod cartridge," will be an obsolete idea.

The following description is taken from the Letters Patent:

Fig. 1 represents an elevation of the ordinary fowling piece; fig. 2 is a vertical sectional view of the same, the barrel having been moved in a position to insert the cartridge into the breech chamber. Figure 3 is a vertical section, showing my improvement as applied to a musket, the barrel and stock having been moved forward in a position to insert the charge into the breech chamber. Figure 4 is an inverted view, showing the projecting bar with its spring catch, of the butt of the stock. Figure 5 is a view of the underside of the stock showing its grooved socket case. Where the same letters of reference occur on the above figures they indicate the same parts.

The nature of my invention and improvement consists in dividing the stock at the junction of the barrel and breech, and furnishing the butt of the stock with a horizontal bar or guide blade projecting from the lower portion thereof, fitted into a socket, sheath, or case, secured to the under-side of the stock, whereby the barrel and stock are supported, and allowed to have a longitudinal movement from the breech for the insertion of the cartridge into the chamber, and using a spring catch attached to the under-side of the said bar, for interlocking with the sheath or case, whereby the barrel is held securely in its place. When closed in with the breech chamber to confine the charge, this manner of mounting the barrel is designed to be applied to the musket, wherein the barrel is firmly banded to the stock and cannot slide independently of the latter.

A is that portion of the stock in which the barrel, B, is mounted; C is the butt of the stock, in which the breech, D, is mounted; E is the cock; G is the trigger guard; H is the cap nipple communicating with the breech chamber; I is the sight of the barrel; J is the chamber of the breech to receive the charge, enlarged at its outer end to receive the end of the barrel, B; when closed in with the breech, D, it is secured firmly to the butt, C, by bolts, *a b c*. K is the bar for supporting the barrel, bolted firmly to the under-side of the butt, and projecting horizontally forward into the case or sheath, L, let into and secured to the stock, whereby the barrel is permitted to move from and towards the breech; this bar, K, is provided with a spring catch, M, to lock the barrel and stock, A, (which are banded together) to the breech where the charge is inserted, by the end thereof entering an opening, N, forward in the case, L; the bar, K, is also furnished with a pin or catch, P, near its outer end, which enters a slot, Q, made in the said case, L, the use of which is to arrest the movement of the barrel, B, from the breech by catching against the end of said slot, Q, (as shown in fig. 3), the slot allowing the barrel, B, and stock, A, to recede toward the breech to be again locked by the spring, M, after the insertion of the charge. The bar, K, is provided with a recess to permit the spring catch, M, to rest from the socket case, L, to move the bar with its stock. The upper portion of the supporting and guide bar, K, is made flat, and the lower portion convex to fit the socket case.

The operation of loading the musket is as follows:—The operator grasps the stock, A, with his barrel in his left hand, and with the fore-finger presses the spring catch, M, inwards, and thus unlocks the projecting bar, K, from the socket case, L, of the stock, and with the right hand separates the butt of the stock with the breech, D, from the other part of the stock, A, and barrel, B, until the pin or catch, P, strikes the end of the slot, Q, in the socket case, L, the cartridge is thus inserted, and the breech and barrel again drawn together, the end of the barrel entering the enlarged portion of the cartridge chamber or breech, D, where they are again locked together by the spring catch, M, entering the opening, N, in the socket case.

C. V. NICKERSON.

Maryland Institute.

On Tuesday evening last week, Walter R. Johnson, Esq., delivered the closing lecture of the season before the institute. The subject was the Social and Industrial Relations of Man in America and Europe. The Baltimore papers (Sun and Clipper) speak in glowing terms of the lecture. The following extract from it is worthy of great attention:—

"In the University of Turin is given by one of its learned Professors a course of chemical lectures specially intended for students of Architecture. It is called chemistry applied to the art of the builder. How eminently serviceable might not such a course be in our country! Had even so much only of the laws of chemistry as relates to the temperature at which wood is liable to take fire been understood or attended to by the builders of our national capitol, we might probably have been spared the deplorable and discreditable loss of our great Congressional Library. And had something been known of the causes of decay and disintegration of building materials, our public edifices at the seat of government would not have so often required the mantle of charity to be spread over their multitude of sins, in the shape of coats of paint, daubings of putty, and patches of plaster."

Cheap Ocean Postage.

A resolution has been introduced into the Senate, in favor of reducing the postage on letters carried across the ocean. We go for such a law, heart and soul. It is certainly a very singular thing that a letter can be carried three thousand miles on land for three or five cents, but cannot be carried across to England, or from it, for less than 24 cents. It is said that the expense of ocean steamers is very great, hence a large postage has to be charged to pay their expenses. This is not good reasoning; the same kind of arguments were employed against the enactment of the cheap land postage law. It is our opinion that an ocean ten cent letter postage, across the Atlantic, would bring in as much money to the Post Office, as the 24 cents for each letter now. The increase of letters would be so great that it would cover all expenses. A ten cent ocean postage, might be tried, we believe, without the least risk; it would be a great blessing to men of business and millions in our country. Let the Senate wake up to cheap ocean postage; that is the intervention we want just now, along with any other useful measure.

An experimental trip has been made by a mall locomotive weighing only three tons, on the Lowell (Mass.) railroad. It ran at the rate of 26 miles per hour, with 50 passengers,

TO CORRESPONDENTS.

J. R., of Mass.—You cannot get a tough metal mixed with tin and zinc—it will not do.

S. N. P., of Mo.—We have never seen the same plan of the float and weight, as the one you have sent. The only plans in use are the float inside attached to a valve, so as to pull up the valve when the float sinks below a certain level.

F. C. W., of Ohio.—There is not the slightest chance for you to obtain a patent on the washing machine; similar arrangements of crank levers and driving wheels are and have been common for years, and plans much more simple than yours are in use, producing like results. You cannot obtain a patent.

E. S. Z., of Md.—You cannot protect yourself in the manufacture of such an article as you speak of; it would be common to all.

A. S., af N. H.—It is doubtful about your being able to obtain a patent. We have seen matches set upon blocks where no waste of wood took place in the preparation, the blocks being split vertically, and left to hang together, substantially the same as yours.

J. T. W., of Ohio—We have transmitted your sketch to Mr. Smith for his attention.

R. & S. H., of Ind.—We suppose the Fair of the American Institute will open about the 1st of October; no announcements have as yet been made. There are machines for folding papers, books, &c. You had better send us a drawing of yours, that we may determine upon the difference between yours and others. The model of the brake can be sent to the American Institute.

A. J. G., of N. Y.—A fee of $30, paid into the Patent Office, covers as many claims as can be made on the machine.

J. M T., of Ill,—We thank you for the information in regard to the reaper; we would use it, but it would involve us in a personal matter, which we always avoid.

C. A. B., of Texas.—We have requested a manufacturer in this city to give such information about the magic lanterns as you desire.

W. M., of Geo.—Reuben Rich's Water Wheel was patented July, 1842.

L. S., of Ohio—We do not know where you can obtain the publications mentioned in yours of the 18th. Mr. H. Bailliere, 290 Broadway, is an importer and publisher of scientific books, and could doubtless supply you.

W. P., of Mo.—There is nothing new in your chain paddle wheel. The plan is well known and has been for many years.

P. W. C., of Eastville—We think Mr. Verleger's invention different from Everett's.

B. W. G., of Ct.—The application of gutta percha to the manufacture of chess-men is not patentable. It could be employed for that purpose, mixed with some non-conducting substance like black lead, as gutta percha softens under slight heat.

A. C., of Ct.—The arrangement for supplying the boiler with water is not patentable, for it has been often done upon the same principle. The principle of Lord Dundonald's Boiler, last week, and Montgomery's this week, in the Sci. Am, embrace that of yours in relation to the circulation of the water.

J. B., of N. J.—If you mean to work the boat by steam, it would be cheaper to propel the boat at once by having the engine on board; but it may not be for the purpose you want it; we shall try and find a plan.

Money received on account of Patent Office business or the week ending March 27.

W. S., of N. Y. $30; J. S. & S. J. M., of Ct., $20; M. & T., of Mass., $10; F. & H, of Mass., $20; E. D., of N. Y., $65; C. W. G., of N. Y., $25; R. F. W., N. Y., $25; T. J E., of N. Y., $30; V. E. R., of Ill., $60; J. H., of O., $50; W. McQ., of N. Y., $30; N. B., of R. I., $30; D. S., of N. Y., $25; J. A. B., of N. Y., $20. J. T., of N. Y.. $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending March 27:

W. T. P. & R., of N. Y.; J. S. & S. J. M., of Ct; E. H., of N. Y.: C. W. G., of N. Y.; D. S., of N. Y.; J. A. B., of N. Y.; H. G. DeW., of N. Y.

New Arrangement.

Several of our readers have expressed a wish to subscribe for some literary journal in connection with the Scientific American, not feeling able to take both. We have entered into an arrangement with the publishers of the "American Model Courier," of Philadelphia, and the "American Union," of Boston, which will enable us to furnish either of the two, with the Scientific American, for $3 per annum. They are literary journals of the first order, and are widely circulated in all sections of the country.

☞ Parties cannot be allowed an addition of one of the Literary papers, as above, by remitting a single dollar after paying their year's subscription to the Scientific American, and money received under such circumstances will be credited in continuance of the Scientific American.

An Important Paragraph.

Whenever our friends order numbers they have missed—we always send them if we have them on hand. We make this statement to save time and trouble, to which we are subjected in replying when the numbers called for cannot be supplied.

The Post Office Laws do not allow publishers to enclose receipts; when the paper comes regular subscribers may consider their money as received.

Subscribers ordering books or pamphlets are particularly requested to remit sufficient to pay postage.

ADVERTISEMENTS.

Terms of Advertising.

4 lines, for each insertion,	-	-	50cts.
8 " " "	-	-	$1,00
12 " " "	-	-	$1,50
16 " " "	-	-	$2,00

Advertisements exceeding 16 lines cannot be admitted; neither can engravings be inserted in the advertising columns at any price.

☞ All advertisements must be paid for before inserting.

SCIENTIFIC MUSEUM.

Agricultural Science.

NIGHT SOIL—ITS VALUE.—The best of all manures is one which in our country is almost wasted. In Belgium, where agriculture is carried to great productiveness, they "order things differently." There, the estimate is, by nice calculation, that it is worth $10 per year for every individual, man, woman, and child. We traverse sea and land, send to Africa and South America to bring elements of fertility which at home we throw away on every farm in the country. What an immense amount is wasted in our cities! It must be the most valuable, containing the elements of all kinds of food consumed by man, and in returning these to the soil, we return the identical constituents which former crops and animals, had taken from the land. Night soil contains the phosphate of lime, which is indispensable to the growth ot animals' bones' and to the nutriment of plants, and which is not supplied from the atmosphere, like carbonic acid and ammonia. All fluid and solid excretions should be preserved by mixing them with burnt clay, saw-dust, ashes, peat or wood charcoal, &c.

ASPARAGUS.—In reply to the query of a "Lady Subscriber," the American Farmer recommends the following mode of renovating old asparagus beds:—

"The bed should be cleared of all stalks, grass and weeds, and then dressed with 7 parts rotten dung and 1 part ashes; the compost should be forked in between the rows carefully, so as not to injure the crowns of the root, then rake and strew salt over the bed with a pretty free hand. This done, cover the bed with straw, which should remain on until the plants get above ground next spring, when the straw should be carefully removed, and the ground given another top-dressing of similar compost, which should be forked in, and the bed receive another dressing of salt."

SOAP-SUDS FOR VINES.—A. J. Downing' editor of the Horticulturist, says:——"I have seen the Isabella grape produce 3,000 fine clusters of well ripened fruit in a season, by the liberal use of manure and soap-suds from the weekly wash."

The effect of soap-suds on other plants is something surprising. A cypress vine, which had remained stationary for a fortnight, when about two inches high, immediately commenced growing after a good watering with soap-suds, and grew about six inches the first five days.

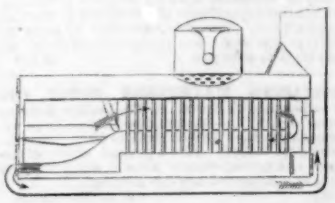
CULTURE OF RICE.—A correspondent of the Rome Courier, recommends the culture of rice in the low wet lands of the Cherokee country, and gives the following directions for its management:—

"I will endeavor to explain how to prepare the field; take one of our branches, the more level the better, with a spring at its head. Cut a ditch on the upper side and keep the water as much on a level as you can. To drain it above the field make a band with the earth excavated on the inner side. On the lower side, cut a larger ditch to carry off the surplus water from the drain. Divide your land by cross banks and ditches, so as to have an equal depth of water when the land is flowed. In each field you must have two trunks, one on the upper ditch to take in the water—the other on the lower ditch to let off the water. When your land is thus prepared, drill it with hoes, 15 inches asunder, and three inches deep; commence to sow about the 15th of April; put two and a half bushels gold rice to the acre; cover it with a bat. Then let the water on and allow it to remain five days. Should the weather be cold you can hold on for ten days. Then draw it off. Let the rice remain dry until the plant has four leaves; hoe, clean, and stir the earth deep below the rows, keep out the grass, and put on the water fourteen days, allowing the ends ot the rice to be seen, draw it off, hoe again as often as convenient. Let the rice remain dry until it joints, then put back the water, and let it remain until it is fit for the sickle; occasionally changing it to prevent stagnation and sickness, and by the time the next season comes round, you will have a fine rice mill to prepare your crop for market."

CHEAP HOT BEDS.—Instead of expensive glass covered boxes, get little rough boxes made of wood and cover them with coarse cloth prepared as follows:—Stretch it and nail it on the top of the boxes, and make a mixture of common white paint and common varnish sold in any painters' shop, and lay it on with a brush. Two coats will answer.—Those who have little gardens can raise early tomatoes or other vegetables for a treat at but a small expense, by using such boxes. Any man can construct them.

On Boilers.---No. 18.

FIG. 36.

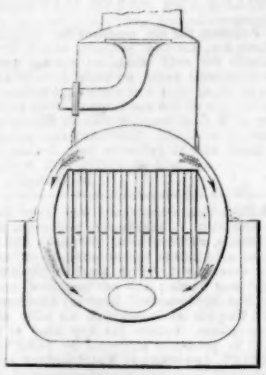


MONTGOMERY'S BOILER.—The accompanying engravings are a section length through the boiler, figure 36, and a cross section through the tubes, figure 37, of the boiler of James Montgomery, who secured a patent for the same in 1845, while residing in Tennessee. The course of the smoke to the stack is indicated by the arrows in the longitudinal section, but the circulation of the water in the cross section, figure 37.

His claim is the arranging the fire chamber or furnace of a tubular boiler at the side, so that the heat shall act on the upper half of the tubes, in combination with a diaphragm, or partition, and flue, to carry off the flame, heated air, &c., to act on the lower half of the tubes after acting on the upper half as described.

He also claims the making of the bottom of the boiler of a conical or dished form, with the mud or blow-off valve in the lowest part of the concavity, in combination with the vertical tubes communicating with the bottom, in the manner herein described, to permit the deposit of the sediment, there being a water space surrounding them, (the tubes), to induce circulation of the water up the tubes and down

FIG. 37.



the surrounding space, to wash the sediment towards the mud or blow-off valve, as herein described. From the annexed engravings the boiler will readily be understood. Its distinguishing feature is the use of the diaphragm, which, being placed about mid way of the tubes causes the fire to act as stated. Several of these boilers have been used in steam vessels of moderate size, and for stationary engines; they have given much satisfaction, causing a considerable saving of fuel, we believe, where they have been used in the place of other boilers.

At or about the time these boilers were designed, Mr. Montgomery surrendered his patent, and obtained a re-issue, dated August 15th, 1848. He claims as follows:—

"1st, What I claim as my invention is the employment of vertical, or nearly vertical water tubes for steam boilers or generators, that open into water chambers at top and bottom, which water chambers are connected together by a surrounding jacket or water space, made singly or in sections, to admit of the free circulation of the water, which, rising in the tubes by the effect of the heat, will descend in the surrounding jacket or external water space or spaces, and thus, by this circulation, carry off the heat from the tubes and prevent them from overheating, as described, when this is combined with the fire chamber, placed at the side of the boiler and outside of the series of tubes, substantially as described, whereby the tubes are prevented from being overheated and unequally expanded to an injurious extent, and the water kept cooler in the jackets than in the series of tubes as described.

2nd, I also claim as my invention, in combination with vertical, or nearly vertical, tubes and surrounding water space or spaces, the employment of a fire chamber outside the series of tubes, and so arranged and located, substantially as described, as to apply the most intense heat at their upper ends and the reduced heat towards their lower ends, substantially as herein described, whereby a greater circulation and evaporation is obtained with a given amount of fuel than by any other plan known to me, thereby not only economizing fuel, but effectually preventing the incrustation of the tubes by the deposit of mineral and other solid matter as described.

3d, I also claim as my invention, the employment of the diaphragm or partition in the flue space between the series ot tubes surrounded by the water space or spaces, and in combination therewith, to divide the same into two parts, that the products of combustion, after passing around the upper ends of the tubes, may pass around their lower ends, substantially as described, and thus more effectually expose the upper end of the tubes to a more intense heat than the lower, as described.

4th, And I also claim the making of the bottom of the boiler of a conical or dished form, with a wind or blow-off valve in the lowest part of the concavity, in combination with the vertical tubes, communicating with the bottom, in the manner herein described, to permit the deposit of the sediment, there being a water space surrounding them to induce circulation of the water up the tubes toward the wind or blow-off valve as herein described."

Crying, Weeping, and Sighing.

Dr. James Wardrop, an English medical author of eminence, in a recent treatise on Diseases of the Heart, says that among the means to influence the circulation and relieve the heart, not in a poetical though proper enough sense of "the spirits," are crying, weeping, sobbing, sighing, coughing sneezing, hiccupping and vomitting; that which we suppose to be a mental being in part a mechanical, or at least a physiological action.

Crying, which consists in a succession of violent and long-protracted expirations, will have the effect, by diminishing the circulation in the pulmonary arteries, of unloading the left heart and large arteries, ot any surplus quantity of blood, caused by the action of the heart having been disturbed, whether by mental causes or from bodily pain; hence, the relief which those who suffer mental affliction or bodily pain, derive from crying—an act which is resorted to throughout the whole animal kingdom to relieve the heart from the hurtful effects ot pain.

From the same cause arise the great langour to the circulation, and even the pernicious effects whicn have so often been known to follow the endurance of severe bodily pain without crying. A man who had no signs of great suffering during a military flogging, dropped down lifeless.

We see many examples of crying in hesterical women; and the screams which are made from fear or from mental agony, must have a powerful influence in unloading a congested heart.

Weeping, also, consists in irregular respiration, either with or without crying, is an effort or voluntary act made to facilitate the pulmonary circulation, and relieve that congestion in the heart which is caused by grief, Weeping, observes, Haller, begins with a full inspiration, after which follow short expirations and inspirations. It is finished by a deep expiration, and immediately followed by a deep inspiration.

Hence arise the baneful effects, and the sensation of fullness, "the fullness of heart," and even of pain in the cardiac region, so frequently experienced by those who have not wept when the mind has been greatly agitated.

Sighing appears also to be a movement employed by nature to relieve the heart from congestion. The full inspirations which are made in sighing, by withdrawing the venous blood from the head, will assist in restoring the balance of the circulation, both within the head and chest, when it has been destroyed by some violent mental emotion or bodily pain.

Important to Railroads.

The patent issued to Truscott, Wolfe & Dougherty, March 17th 1838, for cast-iron car wheels, with double plates, solid hub, and chilled rim, on which an extension for seven years, has been severely contested at Washington before the Patent Office, was rejected on the 17th inst., by the Commissioner. The decision of the office being that it ought not to be extended.

Senator Seward lately argued a case under this patent before the Supreme Court of the United States, and the court decided in favor of the patent.

This made the contest for the extension spirited, and about twenty-five railroad companies in Ohio, New York, Massachusetts, and Connecticut, and other New England States, entered their opposition to it.

The counsel on both sides conducted the case with ability. Keller and Browne appearing for the patent, and Wm. W. Hubbell, Esq., of Philadelphia, for the opposition. The case involved at least a million of dollars. —[Pennsylvanian.

This wheel, we believe, was sold by the inventors and patentees for a mere song—it enriched others—private persons, not the inventors—let the inventors look for pay to those who reaped the benefits of their invention.

LITERARY NOTICES.

AMERICAN RAILWAY TIMES.—This is a large weekly journal, issued on Thursdays, well filled with matter concerning every element of the Railway System, viz., financial management, construction depreciation, improvements in running and machinery,—and every other subject connected with the general economy of the system, furnished from the pens of the most intelligent engineers and practical railway men in the United States. It likewise contains intelligence upon all the railway enterprizes of the country; statistical tables of receipts, expenditures, and income; reports of railway law cases; movements of money and trade; review of the money market; prices current of stocks, etc., etc. John A. Haven, Editor. Price $3 per annum Haven & Jones, publishers, 27 Devonshire st. Boston, Mass.

THE MASONIC JOURNAL.—This is an able monthly magazine, published at Marrietta, Ga., edited by J. B. Randal, M. D. and I. N. Loomis, A. M. It is devoted to Masonry, Science, and Literature. It is a valuable periodical to the members of the craft, as it gives the news of the State and progress of Masonry in all the States, and the world.